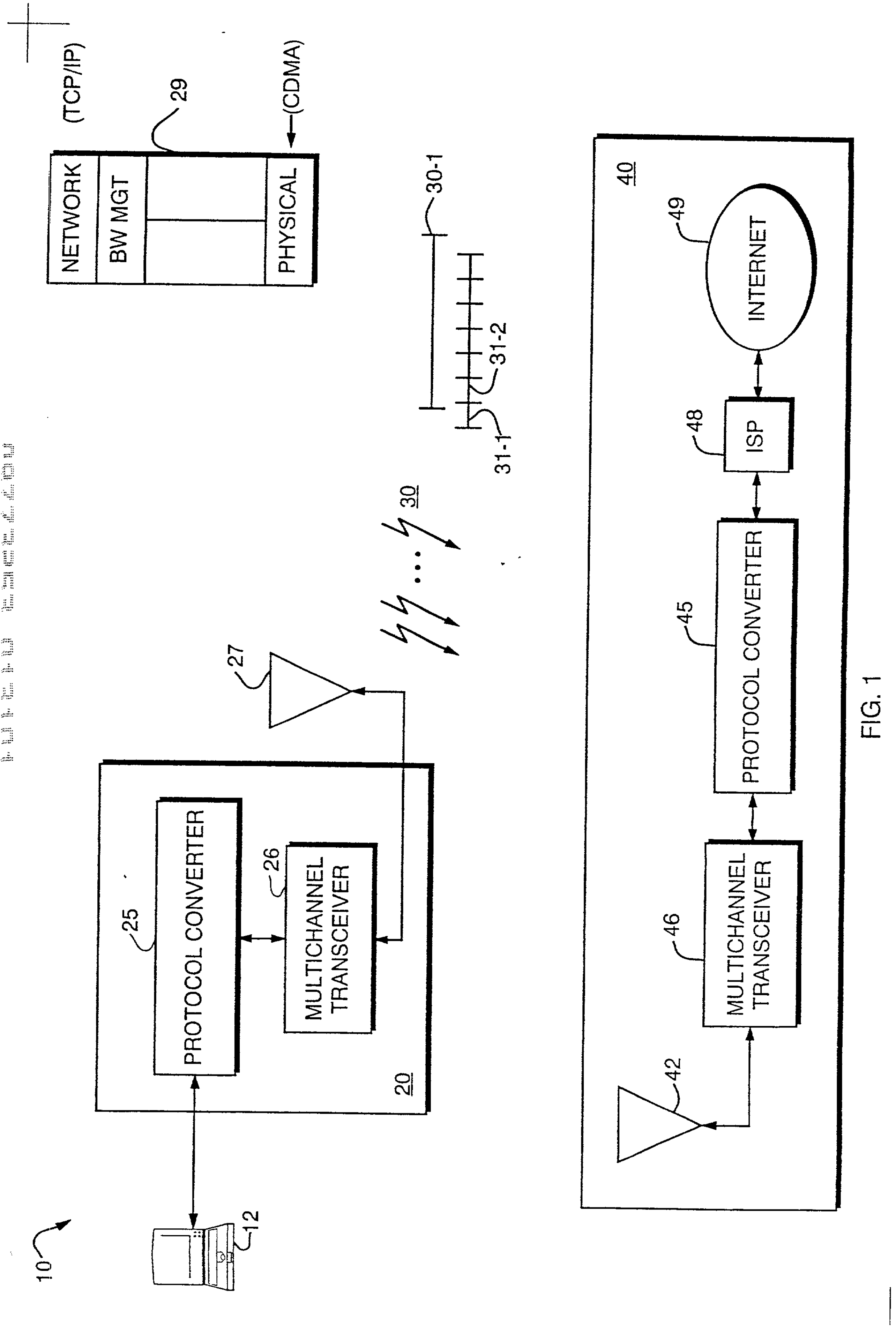

10
12
20
PROTOCOL CONVERTER
25
MULTICHANNEL TRANSCEIVER
26
27
30
30-1
31-1
31-2
NETWORK
BW MGT
PHYSICAL
29
(TCP/IP)
(CDMA)
40
42
MULTICHANNEL TRANSCEIVER
46
PROTOCOL CONVERTER
45
ISP
48
INTERNET
49

FIG. 1

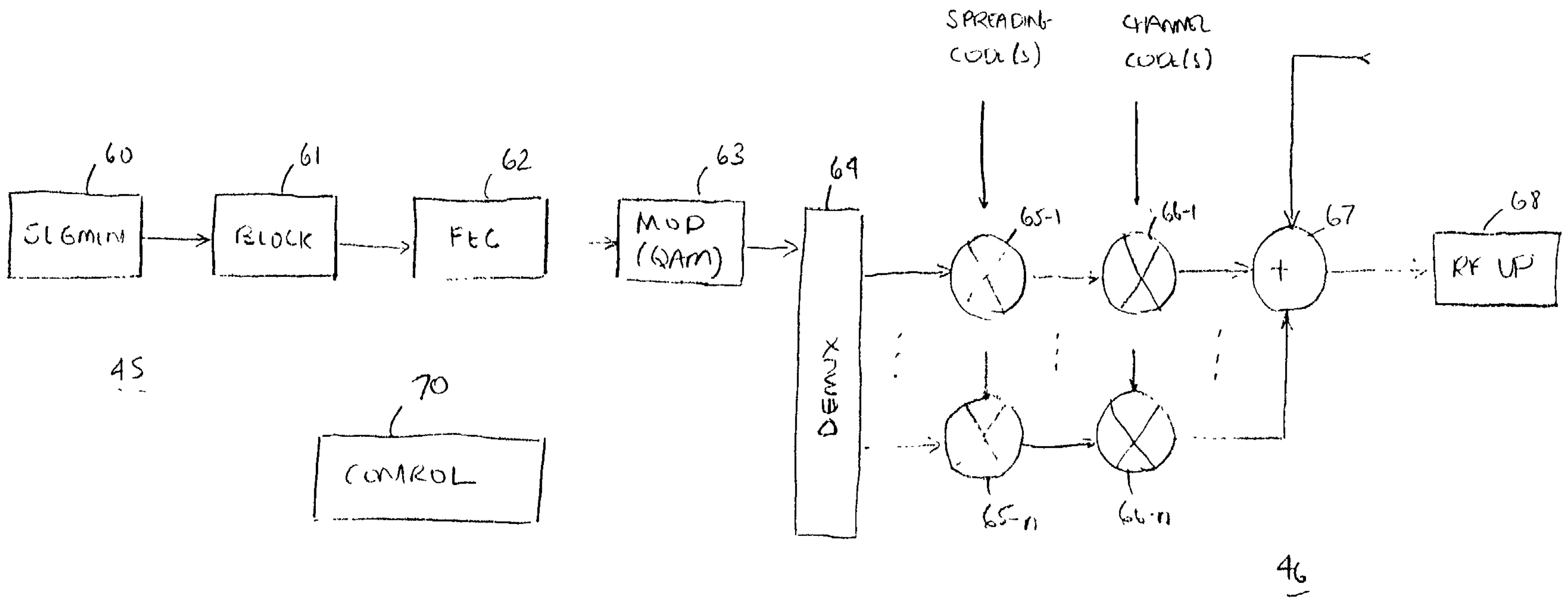


FIG 2

$$\text{data rate} = \frac{\text{chip rate}}{\text{chips per symbol}} \cdot (\#\text{ bits per symbol}) \cdot \#\text{ code words per correlation} \cdot \left(\frac{\text{information blocksize}}{\text{FEC blocksize}}\right)$$

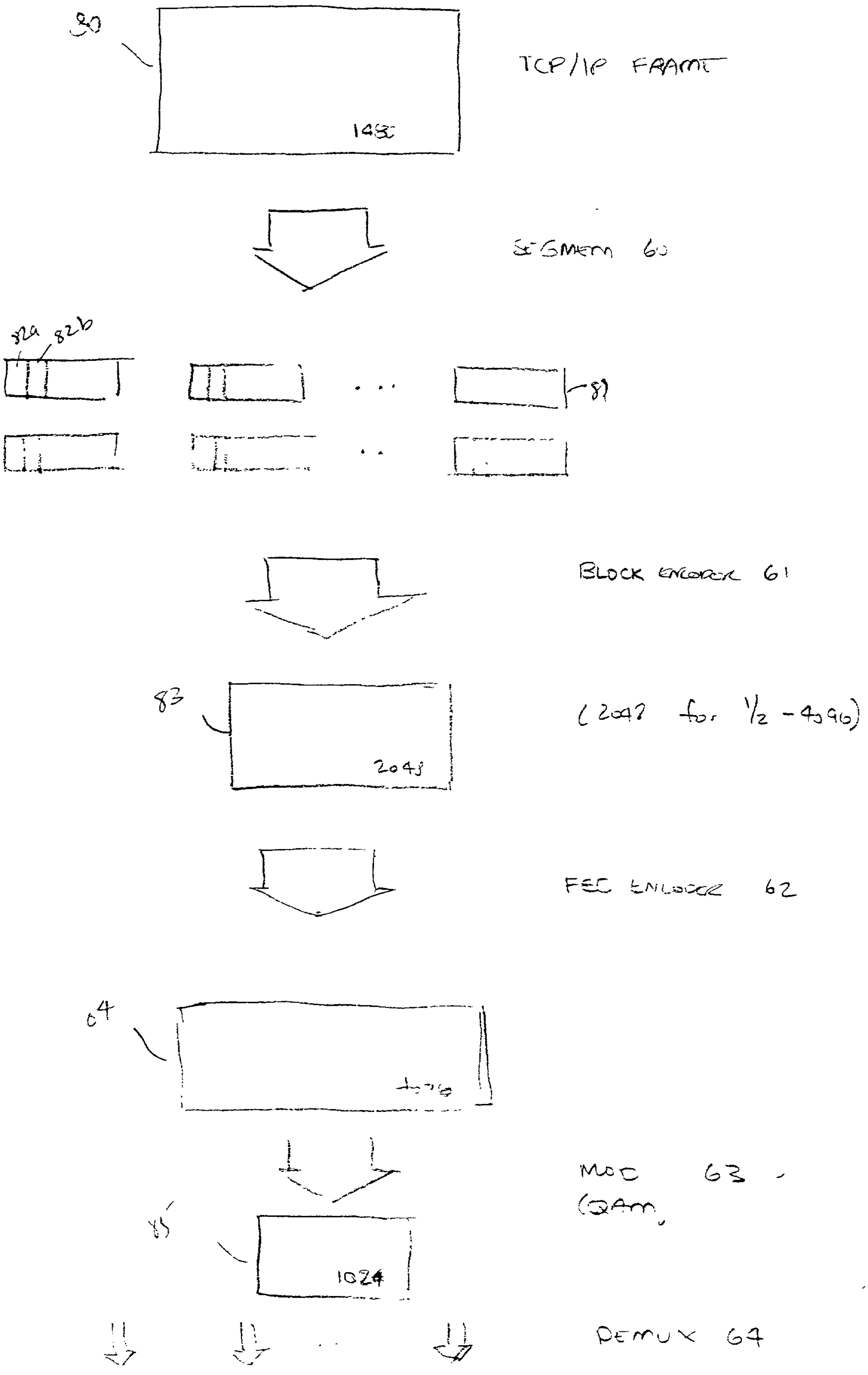
$\frac{1.2288\ \text{MHz}}{32}$

QPSK: 2
8PSK: 3
16QAM: 4
64QAM: 6

2, . . , 28

$\left(\frac{1}{3}\right), \left(\frac{1}{2}\right), \left(\frac{4}{5}\right)$
or
$\left(\frac{1}{3}\right), \left(\frac{2}{3}\right)$

FIG. 3


80
1480
TCP/IP FRAME
SEGMENT 60
82a
82b
81
BLOCK ENCODER 61
83
2048
(2048 for 1/2 - 4096)
FEC ENCODER 62
64
4096
MOD 63
(QAM)
85
1024
DEMUX 64

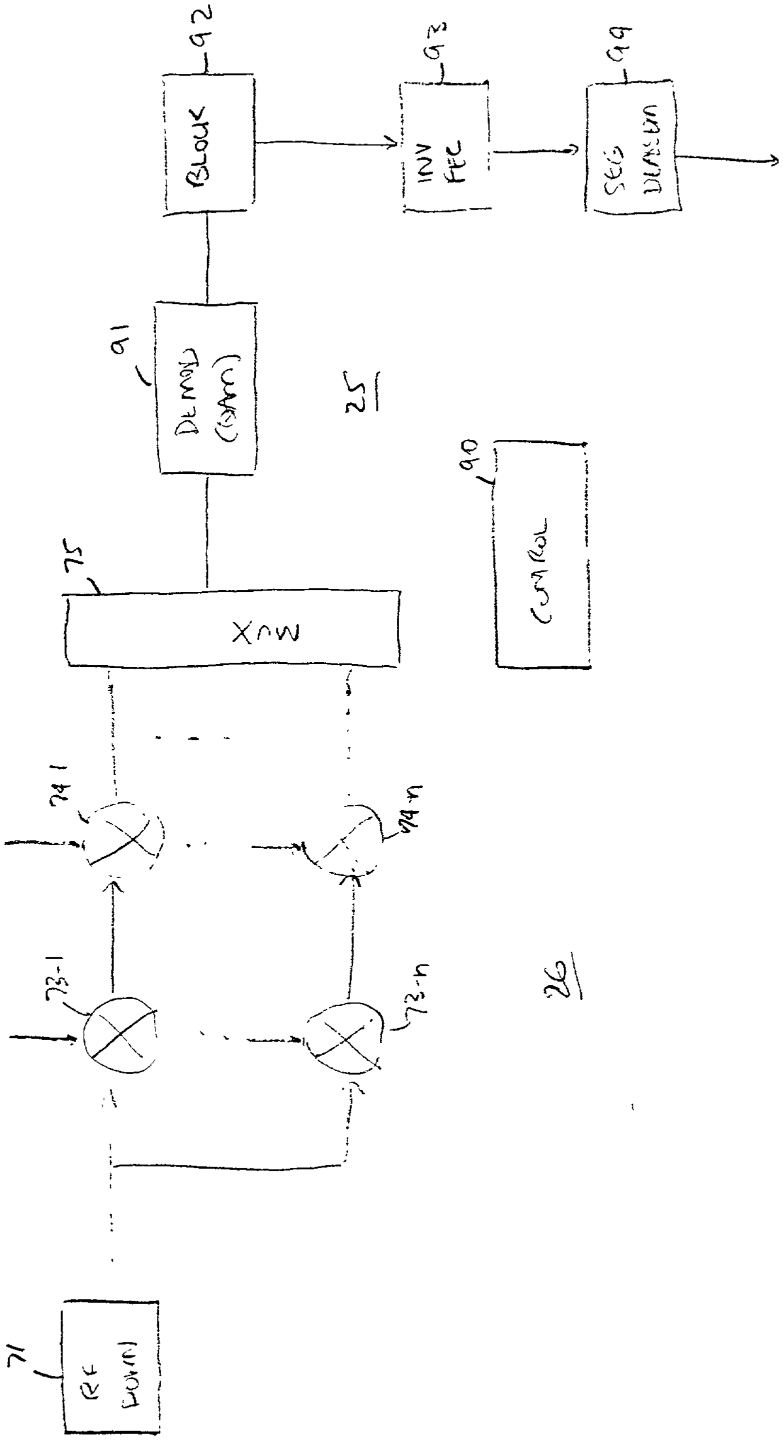

71
RF DOWN
DESPREAD
73-1
73-n
CH. CODES
74 1
74-n
75
MUX
91
DEMOD (QAM)
92
BLOCK
93
INV FEC
94
SEG DEASSM
90
CONTROL
25
26

FIG. 4

Mod	64	64	64	16	16	16	8	8	8	4	4	4	
Info	3249	2048	1331	3249	2048	1331	3249	2048	1331	3249 [redacted]	2048 [redacted]	1331 [redacted]	
Size	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	4096	
Channel Codes													
2	0.366	0.228	0.150	0.244	0.152	0.100	0.183	0.114	0.075	**0.122**	**0.076**	0.050	
4	0.731	0.456	0.299	0.487	0.304	0.200	0.366	0.228	0.150	**0.244**	**0.152**	0.100	
6	1.097	0.684	0.449	0.731	0.456	0.299	0.548	0.342	0.225	**0.366**	**0.228**	0.150	**I-CDMA**
8	1.462	0.913	0.599	0.975	0.608	0.399	0.731	0.456	0.299	0.487	0.304	0.200	
10	1.828	1.141	0.749	1.218	0.761	0.499	0.914	0.570	0.374	0.609	0.380	0.250	
12	2.193	1.369	0.898	1.462	0.913	0.599	1.097	0.684	0.449	0.731	0.456	0.299	
14	2.559	1.597	1.048	1.706	1.065	0.699	1.279	0.799	0.524	0.853	0.532	0.349	
16	2.924	1.825	1.198	1.949	1.217	0.799	1.462	0.913	0.599	0.975	0.608	0.399	
18	3.290	2.053	1.348	2.193	1.369	0.898	1.645	1.027	0.674	1.097	0.684	0.449	
20	3.655	2.282	1.497	2.437	1.521	0.998	1.828	1.141	0.749	1.218	0.761	0.499	
22	4.021	2.510	1.647	2.680	1.673	1.098	2.010	1.255	0.824	1.340	0.837	0.549	
24	4.386	2.738	1.797	2.924	1.825	1.198	2.193	1.369	0.898	1.462	0.913	0.599	
26	4.752	2.966	1.947	3.168	1.977	1.298	2.376	1.483	0.973	1.584	0.989	0.649	
28	5.117	3.194	2.096	3.411	2.129	1.398	2.559	1.597	1.048	1.706	1.065	0.699	

1R eat - Info/Size

Table 1 - Theoretical Effective Information Bit Rate (Mbps) for 4096 Block Size

FIG. 5

Docket No.: 2479.2021-000
Title: Maximizing Data Rate by Adjusting....
Inventors: Hoffmann, *et al.*

Proposed 'I-CDMAximum' physical layer using various numbers of codes and code rates with **2048** block size.

TPC RATE = Info/Size

Mod	64	64	64	16	16	16	8	8	8	4 ~4/5	4 ~1/2	4 ~1/2
~~Info~~	1482	858	684	1482	858	684	1482	858	684	1482	858	684
Size	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048	2048
Codes												
2	0.333	0.193	0.154	0.222	0.129	0.103	0.167	0.097	0.077	0.111	0.064	0.051
4	0.667	0.386	0.308	0.445	0.257	0.205	0.333	0.193	0.154	0.222	0.129	0.103
6	1.000	0.579	0.462	0.667	0.386	0.308	0.500	0.290	0.231	0.333	0.193	0.154
8	1.334	0.772	0.616	0.889	0.515	0.410	0.667	0.386	0.308	0.445	0.257	0.205
10	1.667	0.965	0.770	1.112	0.644	0.513	0.834	0.483	0.385	0.556	0.322	0.257
12	2.001	1.158	0.923	1.334	0.772	0.616	1.000	0.579	0.462	0.667	0.386	0.308
14	2.334	1.351	1.077	1.556	0.901	0.718	1.167	0.676	0.539	0.778	0.450	0.359
16	2.668	1.544	1.231	1.778	1.030	0.821	1.334	0.772	0.616	0.889	0.515	0.410
18	3.001	1.737	1.385	2.001	1.158	0.923	1.501	0.869	0.693	1.000	0.579	0.462
20	3.335	1.931	1.539	2.223	1.287	1.026	1.667	0.965	0.770	1.112	0.644	0.513
22	3.668	2.124	1.693	2.445	1.416	1.129	1.834	1.062	0.846	1.223	0.708	0.564
24	4.001	2.317	1.847	2.668	1.544	1.231	2.001	1.158	0.923	1.334	0.772	0.616
26	4.335	2.510	2.001	2.890	1.673	1.334	2.167	1.255	1.000	1.445	0.837	0.667
28	4.668	2.703	2.155	3.112	1.802	1.436	2.334	1.351	1.077	1.556	0.901	0.718

- Theoretical Effective Information Bit Rate (Mbps) for 2048 Block Size

FIG 6

Proposed 'I-CDMAximum' physical layer using various numbers of codes and code rates with **1024** block size.

Mod	64	64	16	16	8	8	4	4
Info	676	363	676	363	676	363	676	363
Size	1024	1024	1024	1024	1024	1024	1024	1024
							2/3	1/3
Codes								
2	0.304	0.163	0.203	0.109	0.152	0.082	0.101	0.054
4	0.608	0.327	0.406	0.218	0.304	0.163	0.203	0.109
6	0.913	0.490	0.608	0.327	0.456	0.245	0.304	0.163
8	1.217	0.653	0.811	0.436	0.608	0.327	0.406	0.218
10	1.521	0.817	1.014	0.545	0.761	0.408	0.507	0.272
12	1.825	0.980	1.217	0.653	0.913	0.490	0.608	0.327
14	2.129	1.143	1.420	0.762	1.065	0.572	0.710	0.381
16	2.434	1.307	1.622	0.871	1.217	0.653	0.811	0.436
18	2.738	1.470	1.825	0.980	1.369	0.735	0.913	0.490
20	3.042	1.634	2.028	1.089	1.521	0.817	1.014	0.545
22	3.346	1.797	2.231	1.198	1.673	0.898	1.115	0.599
24	3.650	1.960	2.434	1.307	1.825	0.980	1.217	0.653
26	3.955	2.124	2.636	1.416	1.977	1.062	1.318	0.708
28	4.259	2.287	2.839	1.525	2.129	1.143	1.420	0.762

(NO 4/5 EQUIVALENT POSSIBLE)

Theoretical Effective Information Bit Rate (Mbps) for 1024 Block Size

FIG. 7